Start/Stop Performance

Cipher's CacheTape, the latest generation of ½-inch IBM interchange format compatible tape drives, combines the virtues of the industry-standard formatted interface and powerful start/stop capability with the data throughput advantages of cache memory. All these features are packaged on the same reliable, easy-to-use, field-proven mechanics made famous by Cipher's innovative Microstreamer®.

CacheTape, "the Electronic Tape Drive"™, performs all of the traditional tape drive functions today's systems demand—efficiently and reliably. CacheTape applications include: file-oriented disk backup, image backup, transactional journaling, tape sort/merge, tape interchange, data archiving, data acquisition...and more.

CacheTape is also completely interface compatible with existing industry standard tape adapters, including couplers for products from DEC, DG, and TI, and couplers for Multibus, S-100, and other popular mini- and microcomputers.

Software Transparent

Cipher's CacheTape is designed to be fully compatible with present start/stop operating system software and software utilities. Software transparent operation is a feature of the CacheTape start/stop interface, which employs Cipher's unique Electronic Capstan™ technology, thereby obsoleting mechanical tape buffering systems used on prior tape drives.

CacheTape employs Cipher's unique automatic read and write soft error recovery, which provides the system with a lower reported hard error rate. "Error free" write is the net result, with a ten times reduction in reported hard read errors. The system benefits from outboard error management because the host is relieved of burdensome and inefficient error recovery procedures.

File Backup

CacheTape, unlike conventional streaming tape drives, performs high-speed file-oriented disk backup on unmodified system software. This capability offers advantages for on-line multi-user systems, since background mode transactional backup and individual file backup routines can be employed which do not require the system software to dedicate itself to the save/restore operation at the expense of other users.

Versatile Performance

Two CacheTape products are available, CacheTape M890 and CacheTape M891. CacheTape M890 is the price/performance leader, with switch selectable interface transfer rates from 20 kbs to 120 kbs. This makes CacheTape ideal for new multi-purpose systems where streaming tape drives may not provide enough performance and as a replacement for tape drives of 75 ips performance and below. CacheTape M891 offers ultra high performance start/stop capabilities at the interface, with selectable transfer rates from 72 kbs to 384 kbs for all applications which require performance above a 75 ips start/stop vacuum column tape drive. Standard on the CacheTape M891 is burst mode capability to reduce channel busy conditions significantly.

The low profile, 8 ¾" high, horizontally-mounted design saves rack space and permits smaller system racks for the new office-oriented systems. The unique Cipher automatic front loading and threading features make CacheTape user-friendly.

The Cache

A state-of-the-art Z8002 microprocessor and DMA controller work together to supervise vital drive and data management functions of the cache. The cache consists of a 64-kilobyte random access memory (RAM) logically positioned between the drive interface and the read/write formatter. The cache compensates for most data transfer rate fluctuations seen at the drive interface occurring during file-oriented backup operations.

High Capacity 3200 BPI

The 3200 bpi option gives nearly twice the reel capacity of 1600 bpi, allowing unformatted data storage of approximately 92 mb on a standard 2400-foot reel. CacheTape M891 also provides fast backup times comparable to 50 ips start/stop GCR drives or 75 ips streaming GCR in many applications, at half the cost.

- ☐ **Unequalled price/performance benefits**
- ☐ **ANSI and IBM Interchange compatible**
- ☐ **Error-free write operation**
- ☐ **Outboard error management**
- ☐ **Start/stop formatted interface**
- ☐ **User selectable transfer rates**
- ☐ **Uses standard start/stop software**
- ☐ **Plug-compatible with industry-standard PE controllers**
- ☐ **Fully automatic loading and threading**
- ☐ **Powerful maintenance diagnostics**
- ☐ **Low profile design (optional cabinet available)**
- ☐ **High capacity 3200 bpi option (for 92 megabytes per reel, unformatted)**

Series M890/M891 CacheTape™ Tape Drive Specifications

Reel Size
10.5" (26.67 cm) dia
8.5" (21.59 cm) dia
7" (17.78 cm) dia

Recording Mode
Normal
- Phase Encoded (PE)
- ANSI and IBM compatible
- 9 track—1600 bpi (63 CPmm)

High Density (optional)
- Phase Encoded (PE)
- Cipher compatible (submitted for ANSI certification)
- 9 track—3200 bpi (126 CPmm)

Error Handling
Automatic Write Retry
Automatic Read Retry
Interface Error Rates
- Write: "error free" (using defect-free media)
- Read: hard errors—1 in 10^{10} bytes
  soft errors—zero (automatic soft error recovery)

Tape Velocity
100 ips @ 1600 bpi
50 ips @ 3200 bpi
Rewind Speed
- 225 ips nominal

Instantaneous Speed Variation
- ±3% of long term variation

Long Term Speed Variation
- ±2% of nominal speed

Tape Media/Handling
Width
- 0.5 inch (1.27 cm)

Thickness
- 1.5 mil (0.038 mm)

Tension
- 7 oz. nominal (198.5 grams)

Type
- Computer grade
- ANSI X 3.40-1976

Head
- 9 track read after write long life

Tape Cleaner
- Dual precision blades

Environment
Operating Temperature
- +10°C to +40°C

Relative Humidity
- 20% to 85% non-condensing

Altitude
- 0-10,000 ft (3048 m)

Mechanical Description
Mounting
- Standard EIA rack (RS-310-C)

Height: 8.75" (22.2 cm)
Width: 17.0" (43.2 cm)
Depth, from mounting surface
- 22.0" (55.9 cm)

Depth, overall
- 24.5" (52.2 cm)

Weight: 80 lbs (36.4 kg)

Electrical Requirements
Electronics
- Silicon solid state low power Schottky TTL and MOS

Power
- 100, 120, 220, 240 VAC
- +10,-15%, 49-61 Hz
- 270 watts max

Regulatory Safety
- UL approved
- CSA approved as a recognized component
- Meets FCC requirements

Capacity (2400 foot tape)
46 megabytes unformatted @ 1600 bpi
92 megabytes unformatted @ 3200 bpi

MTBF
5,500 hours of use

Cipher's CacheTape Tape Drive features built-in self-test diagnostics, and a powerful set of front panel keyboard selectable diagnostics greatly assists the service engineer in fault isolation. Easy access is provided to any part of the drive without having to remove the CacheTape from the rack, thus simplifying serviceability. CacheTape's single-board circuitry reduces the parts count and eases assembly and maintenance, giving CacheTape an MTTR (mean time to repair) of 30 minutes.

Additional Specifications for Optional Cabinet Unit
Physical Size
- Height: 10.59" (26.90 cm)
- Width: 19.88" (50.49 cm)
- Depth: 26.94" (68.43 cm)

Weight
- 15 lbs (6.825 kg)
  - without streamer
- 95 lbs (43.225 kg)
  - with streamer (total weight)

Regulatory Safety
- UL listed
- CSA certified
- Complies with FCC Class A requirements (with suitable cables)

Interface Performance-User Selectable

CacheTape—Model M890						M890/M891
transfer rate (20–120 kbs)	20	40	60	72	120	☐ Formatter Compatible Interface (TTL low true)
emulated tape speed (12.5–75 ips)	12.5	25	37.5	45	75	☐ Error Recovery: automatic write and read retry
access time (ramp) in milliseconds	30	15	10	8.3	5.0	☐ Block Length: variable with 32 kb max

CacheTape—Model M891								
transfer rate (72–384 kbs average)	72	120	160	192	224	272	320	384
emulated tape speed (45–240 ips)	45	75	100	120	140	170	200	240
access time (ramp) in milliseconds	8.3	5	3.7	3	2.6	2.2	1.5	1.0
access time with ramps disabled (user selectable)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

NOTE: Transfer rates are user selectable to match the performance of CacheTape to multiple host system needs as well as to allow compatibility with lower performance start/stop drives.

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